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Diachrony as a Source of Asymmetric Coding: Using the Past to Explain Naturalness¹

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Abstract

While much discussion on the role of the coding asymmetries relies on synchronic factors such as the nature of processing or more general cognitive, e.g. perceptual factors, in this paper I will focus on diachrony as a source of coding asymmetries. This is not meant to deny the relevance of the synchronic perspective, but the stress on diachrony may help us understand that a number of phenomena can be structurally accounted for, i.e. are the way they are, because of their origin from earlier structural environments.

1. Introduction

The conceptual pair markedness / naturalness has often been employed to account for the rise or diffusion of Asymmetric Coding (= AC) to the effect that it has become a sort of commonplace. For instance, Vennemann (1972: 183) makes direct reference to Wilhelm von Humboldt assuming that «the linguistic sign is uniform: a single concept is symbolized by a constant sound image, and the derivation of complex concepts is reflected in a corresponding derivation in sound». This assumption is modeled into the Uniformity Principle —also called Humboldt's Universal— stating that

«Suppletion is undesirable, uniformity of linguistic symbolization is desirable: Both roots and grammatical markers should be unique and constant». (Vennemann 1972: 184)

¹ Parts of this paper were presented at the workshop on «*Sprachliche Kodierungs-Asymmetrien, Gebrauchsfrequenz und Informativität*» held during the 39th Annual Conference of the *Deutsche Gesellschaft für Sprachwissenschaft (DGfS)*, Saarbrücken 8.-10.3.2017. I thank all people present there for questions and remarks, and especially Martin Haspelmath and Ilja Seržant. Needless to say, I am solely responsible for any mistake contained in the paper.

This principle constitutes the base for his view of language change in terms of language improvement whereby «every change in a language system is a local improvement, i.e. an improvement relative to a certain parameter» (Vennemann 1988: 1). This leads to the formulation of the following Diachronic Maxim:

«Linguistic change on a given parameter does not affect a language structure as long as there exist structures in the language system that are less preferred in terms of the relevant preference law». (Vennemann 1988: 2)

The rationale of the Maxim is that language change not only improves a language system locally, but it also affects first those structures which are valued worse on a scale of markedness along a certain parameter. In other words, preference laws express universally established markedness relations foreshadowing predictions on possible scenarios of change. However, the general outfit of a language system does not become optimal on the whole as a consequence of the change. This is due to the antithetic character of language changes, as is depicted by the following scenario:

«[M]orphological iconicity is highly valued by speakers of languages; it is evidently related to the principle of uniform symbolization. But the iconic construction of words with complex meanings creates many long words, and length is a disadvantage on another parameter, especially for frequently used words. Thus we need not be surprised that the most frequent words of many languages are not iconic but suppletive and are, when lost, often not replaced with iconic constructs but with new suppletive forms». (Vennemann 1990: 14-15)

As is well known, morphological iconicity and its theoretical underpinning in Humboldt's Universal stand also at the heart of Dressler's (2003: 463) Diachronic Predictions which explicitly center on naturalness as the theoretical counterpart of markedness:

«(i) the more natural a phenomenon is on a given morphological parameter, the more stable, that is, the more resistant it should be to morphological change (but not necessarily to phonological or syntactic change);

(ii) if, of two comparable morphological options X and Y, X is more natural than Y on a given parameter Z, then natural / unmarked change of X to Y should be more likely to occur than the reverse, unnatural / marked change Y to X».

As these predictions relate to morphology, they are strictly connected with the main tenet of Natural Morphology which consists in the preference for so-called Constructional Iconicity, namely for constructional icons as cognitively preferred complex signs (cf. Gaeta 2019 for a survey). Accordingly, Dressler (2003: 463) suggests classifying the different means of marking plural in English on a scale of naturalness where the forms occurring at

the lowest degrees are predicted to undergo language change in compliance with his Diachronic Predictions and with Vennemann's Diachronic Maxim:

«the various types of English plural formation can be classified as follows: *oaf-s* is diagrammatic, that is, most iconic, because there is an analogy between morphotactic addition of a plural marker and addition of the morphosemantic feature of plurality; umlaut plural *feet* with vowel modification (from *foot*), instead of addition, is only metaphoric (i.e., with weaker iconicity); *loav-es* (from sg. *loaf*) lies in between; *sheep* is non-iconic».

Vennemann's and Dressler's view concur in posing a basically anti-separatist and «incremental» synchronic principle underlying linguistic symbolization. This view can be epitomized by Givón's (1991) Meta-Iconic Markedness Principle according to which «[c]ategories that are cognitively marked —i.e. complex— tend to also be structurally marked». It is important to stress that on the basis of this principle predictions on possible scenarios of language change are derived. Clearly, like in a house of cards, if one removes the synchronic principle, also the diachronic predictions fall down. In this perspective, many alternative morphological frameworks assume a separatist and realizational view in which content is taken to be separate and independent from its formal expression (cf. Aronoff 1994, Beard 1995) and is encoded «realizationally», that is, via its direct association with the root which licenses its formal, overt realization (cf. Stump 2001, Baerman, Brown, and Corbett 2005). In this view, no prediction can be made with regard to the formal complexity of the word as the mirror of cognitive complexity, as well as on possible diachronic scenarios allegedly reflecting the effects of iconicity.

In addition, the idea of an independent cognitive principle responsible for the preference for iconic or incremental coding has also been criticized by those who insist on the usage-based nature of language systems. Accordingly, the alleged preference for iconic coding results from a frequency asymmetry underlying the different processes involved. Although one might think of frequency as reflecting some kind of deeper underlying cognitive force, this need not be the case. In this regard, Haspelmath (2008) emphasizes the efficacy of a purely frequentist approach which can largely dispense with concepts like markedness or cognitive complexity.

In a way, in this paper I will try to adopt a similar line of argumentation, abstracting away from cases of AC which have been connected with the effect of synchronic factors such as the nature of processing or more general cognitive —e.g. perceptual— factors like Givón's Meta-Iconic Markedness Principle. Instead, I will reverse the perspective and focus on diachrony as a source of coding asymmetries without making any appeal to synchronic principles like Humboldt's Universal or the Meta-Iconic Markedness Principle. This is not meant to deny the relevance of the synchronic perspective, but the stress on diachrony may help us understand that a number of phenomena

can be structurally accounted for, i.e. are the way they are, because of their origin from earlier structural environments. In particular, I will discuss four main sources of AC, namely Grammaticalization in §2.1, System Adequacy in §2.2, Maximal Differentiation in §2.3 and Borrowing in §2.4. The final §3 presents the conclusions discussing the status of Humboldt's Universal and of the Meta-Iconic Markedness Principle from the perspective adopted here.

2. Diachronic sources of AC

2.1. *Grammaticalization as a source of AC*

First and foremost, AC arises as a consequence of processes of Grammaticalization intended in the «narrower, prototypical sense» as reflecting «the change by which lexical items and constructions used in certain contexts come to mark grammatical relations» (cf. Hopper and Traugott 2003: 60). In this perspective, the increase of expressivity, i.e. of formal coding, of the derived form results from the stepwise process of reduction of earlier lexemes subsequently grammaticalized as morphological markers. Such an increase of expressivity is originally aimed at by the speakers who intend to create in this way new formulas to catch the attention of the audience —Haspelmath (1999) speaks in this regard of «extravagance»— which subsequently undergo processes of conventionalization (and «entrenchment») and ultimately develop into grammaticalized structures. This explains the AC because the more expressive formula usually contains an additional semantic nuance that is subsequently expanded into a grammatical construction. In this regard, I will make two examples depicting the process whereby original lexemes develop respectively into either derivational or inflectional affixes.

The Present-Day German (= PDG) suffix for forming adverbs, namely *-(er)weise*, found in *komisch* 'funny' → *komischerweise* 'funnily', *normal* 'normal' → *normalerweise* 'normally', etc., has clearly developed from a syntactic environment reflecting a nominal phrase —possibly headed by a preposition according to some reconstruction, cf. Elsner (2015) for discussion— used as an adjunct, and has subsequently undergone univerbation: (*in*) *komischer Weise* 'in a funny manner' > *komischerweise* 'funnily'. Although the process began several centuries ago, its fixation is quite recent insofar it displays an increasing productivity in the last century.² In our perspective, it is important to stress that the Grammaticalization of *-erweise* restores an AC

² In this regard, see Erben (1983: 137) who observes that «[a]ls einigermaßen produktive Ableitungsmöglichkeit wäre höchstens das Baumuster: BA-*er-weise* zu erwähnen» [as somewhat productive derivational possibility (*scil.* for adverbs) one should at the utmost quote the pattern 'base word + *-er-weise*'], while more recently (cf. DUDEN: 772) *-(er)weise* is qualified as «highly productive».

which used to be present in Old High German (= OHG) thanks to the occurrence of an adverb-forming suffix *-o*, but was lost in subsequent times as a consequence of the general reduction of unstressed final vowels in Middle High German (= MHG):

- (1) a. OHG *snel* ‘quick’ → *snello* ‘quickly’ > MHG *snëll(e)* > PDG *schnell* ‘quick / quickly’
- b. OHG *yrstuant er uf tho snello, so was Krístes willo* (Ot., Ev. 4, 77, 31)
stood he up there quickly so was Christ’s will
‘Thus, he stood quickly up, this was Christ’s will’
- c. PDG *also stand er schnell auf, so war der Wille Christi*
thus stood he quick up, so was the will Christ’s
‘Thus, he stood quickly up, this was Christ’s will’.

In the PDG sentence corresponding to the OHG one, the adjective *schnell* is directly used in adverb function without any overt marking in contrast to the OHG adverb *snello*. At any rate, traces of the increased expressivity of the new adverbs are found in the use of the new pattern for sentence adverbs while this is not possible with adjectives which are overtly marked as adverbs:

- (2) a. *Dummerweise* / **Dumm* hat Bernhard geantwortet.
‘Stupidly, Bernhard has answered’.
- b. *Bernhard* hat *dumm* / *dummerweise* geantwortet.
‘Bernhard has answered in a stupid way / stupidly’.

While *dummerweise* as a phrasal adverb can be used sentence-initially, *dumm* — which only displays a manner value — can only be used close to the main verb. From the perspective of Grammaticalization adopted here, it is not surprising that the higher expressivity of phrasal adverbs is connected with the longer forms which reflect the speakers’ eye-catching, extravagant communicative intentions rather than with the — diachronically «older» — form of the adjective used in adverbial function.

As for the inflectional domain — the so-called grammaticality cline (cf. Hopper & Traugott 2003: 7) — we can briefly mention the development of a future suffix *-dén* from the deictic adverb *dén* ‘then’ in Töitschu, a Walser German dialect spoken in the village of Issime placed in Aosta Valley in Northern Italy (cf. Angster *et al.* 2017, Angster & Gaeta 2018):³

³ The Töitschu forms are provided in compliance with the orthographic norms adopted by the dictionary compiled by the *Walser Kulturzentrum*. Note in particular that <e>, <é>, <w> and <sch> roughly correspond respectively to [ɛ], [e], [w] and [ʃ] while the vowel sequence <éi> corresponds to a true (falling) diphthong: [eɪ], etc. (cf. Angster *et al.* 2017 for discussion).

	Present		Future	
	'to be'	'to know'	'to be'	'to know'
1.sg.	<i>bin</i>	<i>wiss</i>	<i>bindén</i>	<i>wissdén</i>
2.	<i>bischt</i>	<i>wissischt</i>	<i>bischtén</i>	<i>wissischtén</i>
3.	<i>ischt</i>	<i>wisst</i>	<i>ischtdén</i>	<i>wisstén</i>
1.pl.	<i>séin</i>	<i>wissu(n)</i>	<i>séindén</i>	<i>wissendén</i>
2.	<i>séid</i>	<i>wissit</i>	<i>séitdén</i>	<i>wissitdén</i>
3.	<i>séin</i>	<i>wissu(n)</i>	<i>séindén</i>	<i>wissendén</i>

As an effect of the agglutination of the adverb an AC is introduced into the verbal paradigm. However, the incremental, iconic marking is partially disturbed by incipient processes of morpho(phono)logization of the suffix due to the voice assimilation of the adverb's initial consonant in the 2nd sg. forms *bischtén* and *wissischtén* — and probably in the 3rd sg. and in the 2nd pl. forms in spite of the spelling — and to vowel reduction in the 1st and 3rd pl. forms *wissendén* as predicted by Vennemann's view of antithetic changes.

While it apparently militates in favor of markedness, it must be emphasized that Grammaticalization is by itself not related to markedness nor sensible to its effects and in fact can also bring about utterly marked morphological coding. This is for instance the case of the rise of introflexion which is observed with the so-called «trapped morphemes» (cf. Harris and Faarlund 2006), namely morphemes which turn out to be «trapped» by the Grammaticalization of other morphemes. For instance, introflexion came about in Latin when the pronouns + *ipse* 'himself' and *quisque* 'every' were formed thanks to the Grammaticalization of the particles *-pse* and *-que*, displaying respectively an intensive and an additive value, in combination with the older pronouns *is* 'he' and *quis* 'who'. While in the first case introflexion was completely eliminated re-establishing the normal pattern in Latin with inflectional markers placed at the right edge of the word: Old Latin **ispse* 'himself.NOM' / *ea-pse* 'herself.NOM', *eum-pse* 'himself.ACC' / *eam-pse* 'herself.ACC', *eō-pse* 'himself.ABL' / *eā-pse* 'herself.ABL' > Classical Latin *ips-e* / *ips-a*, *ips-um* / *ips-am*, *ips-ō* / *ips-ā* (possibly via syntactic doubling of the inflectional marker as shown by the forms *eumpsum*, *eōpsō*), it was fully retained in the case of *quis-que* 'every.M.SG.NOM', *cuius-que* 'every.SG.GEN', *cū-que* 'every.SG.DAT', etc. In a similar way, introflexion came about in Spanish due to the Grammaticalization of the original reflexive pronoun, which was cliticized and subsequently agglutinated to the verb, insofar as the rest of the verbal inflection turned out to be trapped (cf. NGLE: 54):

- (3) a. Sp. *márch-e-n-se* 'leave-SBJV-3PL-REFL'
 b. Subst. Sp. *márch-e-n-se-n* 'leave-SBJV-3PL-REFL-3PL'
 c. Subst. Sp. *márch-e-se-n* 'leave-SBJV-REFL-3PL'

However, in Substandard varieties of Spanish morphological change partially eliminates introflexion via the doubling of the person / number marker in final position (3b) and its subsequent drop in the internal position (3c). The force driving the morphological change has been claimed to refer to universal principles like the Principle of Relevant Order (= RelOrd, cf. Bybee 1985: 35, see Gaeta in press a for discussion) or the Principle of Externalization of Inflection (= ExtInfl, cf. Haspelmath 1993). In this regard, it must be added that RelOrd is far more precise than ExtInfl insofar as it is able to predict the shift towards the word's right edge of the person / number markers with regard to the valence-related reflexive marker *se* because the latter reflects a meaning which is more relevant to the meaning of the verbal base to the extent that its semantic content directly affects or modifies the semantic content of the verb (see Bybee 1985: 13). In contrast, ExtInfl is not able to make any prediction insofar all involved markers belong to inflection, as shown by the example: *Ahora de-me-n un abrazo* 'Now give.SBJV-me-3PL a hug' (NLGE: 54) in which the pronoun is inflected. RelOrd establishes a hierarchy of preferences whereby some inflectional markers are preferably placed closer to the verbal stem in accordance with the supposed universal logic of markedness values expressed throughout a verbal paradigm. On the other hand, it has been suggested treating such cases of morpheme reordering in terms of analogical change insofar as «the change from Latin acc. sg. m. *eumpsum* to *ipsum* can only be explained by analogy with the nom. sg. m. *ipse*» (Haspelmath 1993: 303). In this regard, it has to be noted that markedness has also been used to account for analogical change. For instance, the unmarked status of the third person singular has been used to motivate the well-known restructuring observed in the present indicative of the Polish verb for BE:

Table 1

Changes in the present indicative of the Polish verb *być* 'to be'

	Old Polish		Present-Day Polish
1.sg.	<i>jeś-m</i>	>	<i>jest-em</i>
2.	<i>jeś</i>	>	<i>jest-eś</i>
3.	<i>jeś-t</i>	=	<i>jest</i>
1.pl.	<i>jes-my</i>	>	<i>jest-eśmy</i>
2.	<i>jeś-cie</i>	>	<i>jest-eście</i>
3.	<i>są</i>	=	<i>są</i>

Apparently, the original form of the third person singular was reanalyzed as base form and spread through the paradigm — with the noteworthy exception of the third plural — additionally taking the clitic forms of BE employed as inflectional markers. After the change the 3rd sg. form can be analyzed as unmarked and displaying a zero suffix: *jest-Ø*. Besides a number of criticisms that have been raised against such a view (cf. Hock 1991: 221-222 for a detailed discussion), it is clear that Grammaticalization works in a completely different way and can also give rise to utterly marked morphological coding which — as we have seen above — can sometimes be eliminated by making reference to analogical change.

On the other hand, while Grammaticalization normally ends up with AC, exceptions do occur. In fact, as «a side effect of another grammaticalization process» (Haspelmath 1998: 34) Anti-AC can also arise in which the base form turns out to be longer than the derived one. This usually results as a consequence of exaptive changes, which consist in the refunctionalization of extant complex structures reused to convey a different meaning (cf. Gaeta 2016a, in press b). For instance, in Tsakonian Greek earlier (subjunctive) presents are exapted into future forms, e.g. Classical Gr. (*hína*) *phthaín-ti* '(he) arrives / that (he) arrive' > Tsakonian Gr. *na ftén-i* '(he) will arrive', in concomitance with the grammaticalization of new presents based on a periphrasis consisting in the verb BE + present participle: *éñi fténu* 'he comes, lit. is coming.M'. Similarly, in Udmurt the new present form *myn-išk-o* 'I go / am going' is based on the Grammaticalization of the originally imperfective-antipassive suffix *-šk-* occurring for instance in *vur-yny* 'to sew' → *vur-šk-yny* 'to be occupied with sewing', while the original unsuffixed form has acquired a future value: *myn-o* 'I will go'. These examples show that Grammaticalization is not (teleologically!) bound per se to give rise to AC, but it follows its own way, sometimes also creating Anti-AC. However, AC often sprouts because of the typical «gluing» nature of Grammaticalization.

2.2. System Adequacy as a source of AC

A second diachronic source of AC relates to what after Wurzel (1984) goes under the name of System Adequacy, i.e. the tendency of a morphological system towards developing internal consistency by increasing the strength of its System-Defining Structural Properties (= SDSPs), for instance enforcing the reach of extra-morphologically motivated inflectional paradigms. Accordingly, the attraction of the German verb *brauchen* 'to need' towards the sphere of modals brings about the rise of AC insofar as a new singular / plural opposition in the 3rd person of the present indicative is created adopting the typical inflectional model of the modals (cf. Gaeta 2002):

- (4) a. *soll* / *soll*[η] ‘should.3SG/PL’, *muss* / *müss*[η] ‘must.3SG/PL’,
kann / *könn*[η] ‘can.3SG/PL’, *darf* / *dürr*[η] ‘be allowed.3SG/PL’,
mag / *mög*[η] ‘may.3SG/PL’
b. $PSC_{Mod}: [V_{Modal}] \supset -\emptyset/1\&3SG$
c. *brauch-t* / *brauch*-[η] ‘need-3SG/PL’ > *brauch* / *brauch*-[η]
d. *Lourdes muss / soll / brauch nicht weinen.*
‘Lourdes must / should / need not cry’.
e. *Ihr müsst / sollt / braucht / *brauch nicht weinen.*
‘You must / should / need not cry’.

As shown by (4a), all German modals display the same inflectional feature, namely the zero suffix in the third (as well as in the first) person singular. This is summarized by the Paradigm Structure Condition (= PSC) in (4b) which is specifically tailored for modals. The morphological change depicted in (4c-d) makes the verb *brauchen*, which has acquired the extra-morphological property of being a modal, more similar to the inflectional class. Note that phonological erosion cannot serve as an explanation of the change because the homonymic 2nd pl. form *braucht* is not affected by the change, as shown by (4e).

A second, more intriguing, example showing the effects of System Adequacy on AC is provided by the so-called *kurzformige Verben* (= KV, ‘short-formed verbs’) of the Walser German dialects spoken at the most southern edge of the Alemannic area. In spite of their different origin from modals, auxiliaries, causatives, permissives, etc. (cf. Angster & Gaeta 2018), KVs display interesting convergence phenomena. For instance, in Guryner Titsch spoken in Bosco Gurin a general syncretism of the 1st sg./pl. person is found in all inflectional classes due to the extension of the 1st pl. form (cf. Russ 2002: 112):

Table 2

Inflectional classes of the verbs in Guryner Titsch

	Strong Verbs	Weak Verb-1	Weak Verb-2	Weak Verb-3
1.sg./pl.	<i>fri:ba</i> ‘write’	<i>teila</i> ‘divide, share’	<i>mɔxxu</i> ‘make’	<i>laba</i> ‘refresh’
2.sg./pl.	<i>fribʃt</i> / <i>fri:bat</i>	<i>teilʃt</i> / <i>teilat</i>	<i>mɔxxuʃt</i> / <i>mɔxxut</i>	<i>labaʃt</i> / <i>labat</i>
3.sg./pl.	<i>fribt</i> / <i>fri:ban</i>	<i>teilt</i> / <i>teilan</i>	<i>mɔxxut</i> / <i>mɔxxun</i>	<i>labat</i> / <i>laban</i>

In Wurzel’s (1984) model, this morphological feature is captured by the SDSP valid for all verbs displayed in (5a) below:

- (5) a. $SDSP_V: [inf. \equiv 1sg.pres.ind. \equiv 1pl.pres.ind.]$
b. $PSC_{Mod}: [V_{Modal}] \supset -u/1PL$
c. $PSC_{KV}: [V_{KV}] \supset -v/1PL$

As shown by the PSC_{Mod} shown in (5b), the modals do not agree with the general $SDSP_V$ insofar as a suffix *-u* is retained in the 1st pl. form (cf. Russ 2002: 117-118):

Table 3
Modal verbs in Guryner Titsch

	‘can’	‘may’	‘be allowed’	‘should’	‘must’
1.sg./pl.	<i>xv / xunu</i>	<i>mvk / mugu</i>	<i>tɔrf / turfu</i>	<i>sol / sulu</i>	<i>myas / myassu</i>
2.sg./pl.	<i>xvɔnʃt / xunut</i>	<i>mvkʃt / mugut</i>	<i>tɔrʃʃt / turfut</i>	<i>solʃt / sulut</i>	<i>myaʃt / myassut</i>
3.sg./pl.	<i>xv / xunun</i>	<i>mvk / mugun</i>	<i>tɔrf / turfun</i>	<i>sol / sulun</i>	<i>myas / myassun</i>

The KVs, which consist of auxiliaries, semi-auxiliaries and other frequent or semi-grammaticalized verbs, are shown not to agree with the general $SDSP_V$ seen in (5a). Instead, they developed a new suffix *-v* in the 1st pl. person which turn out to characterize this inflectional class by means of the specific PSC_{KV} in (5c), similarly to the other inflectional class of largely grammaticalized (and short) verbs, namely the modals:

Table 4
KVs in Guryner Titsch

	‘be’	‘have’	‘do’	‘begin’	‘go’	‘let’	‘stand’
1.sg./pl.	<i>be / siv</i>	<i>ha / hev</i>	<i>tya / tiav</i>	<i>afv / afa:v</i>	<i>gv / ga:v</i>	<i>lv / la:v</i>	<i>ftv / fta:v</i>
2.sg./pl.	<i>befʃt / sit</i>	<i>heʃt / het</i>	<i>tyaʃt / tiat</i>	<i>afvʃt / afa:t</i>	<i>geʃt / geɲgat</i>	<i>lvʃt / la:t</i>	<i>fteʃt / fte:ndat</i>
3.sg./pl.	<i>eft / sen</i>	<i>het / hen</i>	<i>tyat / tian</i>	<i>afv:t / afa:t</i>	<i>geis / ga:n</i>	<i>lv:t / la:n</i>	<i>fteit / fta:n</i>

The suffix was recruited from a cliticized subject pronoun: *hen wiar* ‘have we’ > *hewwiar* > *hew wiar* (cf. Russ 1990: 387), and clearly adopted to characterize the inflectional class as different from the rest of the other verbal classes captured by the general $SDSP_V$ in (5a).

Also in this case, the increase of System Adequacy does not necessarily give rise to AC, as shown by cases in which Anti-AC is created as a consequence of System Adequacy. For instance, in Milanese the subtractive plural marking found in feminine nouns ending with *-a* like *scala / scal* ‘staircase(s)’, *carta / cart* ‘paper(s)’ —where it is due to the generalized loss of all final vowels but /a/— is extended to feminine nouns

where a zero plural was expected similarly to the most frequent class of nouns like *mur* ‘wall(s)’ and *red* ‘net(s)’ (cf. Gaeta 2016b, in press a for details): Lat. CARNE(M) / CARNE(S) ‘meat(s)’ > Mil. ⁺*carn* / *carn* > *carna* / *carn*, Lat. VESTE(M) / VESTE(S) ‘dress(es)’ > Mil. ⁺*vest* / *vest* > *vesta* / *vest*. The extension of the subtractive coding, i.e. of an Anti-AC in the terms adopted here, is due to a better coupling of the inherent lexical properties of the nouns and of their plural formation. In particular, the reach of the PSC tailored for the class of *a*-feminines like *scala* —holding that non-masculine nouns ending with /a/ form their plural by Vowel Deletion (= VD), cf. (6a)— is enlarged because it is better specified than the other PSC holding for the most widespread class among masculine and feminine nouns (6b):

- (6) a. $\text{PSC}_{a\text{-Fem}}: [\text{N}_{-M, a\#}] \supset \text{VD/PL}$
 b. $\text{PSC}_N: [\text{N}] \supset -\emptyset/\text{PL}$

Again, this shows that in spite of a clear advantage in terms of AC observed in several cases accounted for by System Adequacy, the latter can also have the opposite effect; accordingly, the advantage in terms of AC must be thought as a side-effect and is in fact not aimed at by System Adequacy.

2.3. Maximal Differentiation as a source of AC

A third diachronic source of AC comes from the effects of the Principle of Maximal Differentiation (cf. Gaeta 2017, 2018):

Principle of Maximal Differentiation: In the course of a language change having an impact on the categorial status of particular linguistic units, a progressive differentiation of the involved forms takes place with regard to their original morphophonological and semantic structure as well as their original syntactic context.

Accordingly, the layering of the same form in different functions is solved by developing a new shape for the new function. This principle can also be related in more or less direct way to Grammaticalization as discussed in §2.1 above because the change of categorial status is quite common in this area (cf. Gaeta in press b for discussion). In our perspective, its effects can also give rise to AC. For example, still in the MHG period the morpheme *der* / *diu* / *daz* served both as article and as a pronoun, in particular as demonstrative or relative pronoun. All these functions were already present in OHG, in which its original demonstrative function was already being expanded into the usage as relative pronoun and as definite article (cf. Szczepaniak 2009: 73-78). It has to be added that the latter usage clearly became in MHG the most frequent function. Subsequently, a process of formal differ-

entiation began with the aim of opposing the article, which —corresponding to the most common usage— retained the form of the source morpheme, to the less frequent pronominal usages:

Table 5

The development of the article and of the determinative/relative pronoun in German

		MHG			PDG					
		Art / Dem / Rel			Art			Dem / Rel		
		M	N	F	M	N	F	M	N	F
Sg	Nom	<i>der</i>	<i>daz</i>	<i>diu</i>	<i>der</i>	<i>das</i>	<i>die</i>	<i>der</i>	<i>das</i>	<i>die</i>
	Gen	<i>des</i>		<i>der(e)</i>	<i>des</i>		<i>der</i>	<i>dessen</i>		<i>deren / derer</i>
	Dat	<i>dem(e)</i>		<i>der(e)</i>	<i>dem</i>		<i>der</i>	<i>dem</i>		<i>der</i>
	Acc	<i>den</i>	<i>daz</i>	<i>die</i>	<i>den</i>	<i>das</i>	<i>die</i>	<i>den</i>	<i>das</i>	<i>die</i>
Pl	Nom	<i>die</i>	<i>diu</i>	<i>die</i>	<i>die</i>			<i>die</i>		
	Gen	<i>der(e)</i>			<i>der</i>			<i>deren / derer</i>		
	Dat	<i>den</i>			<i>den</i>			<i>denen</i>		
	Acc	<i>die</i>	<i>diu</i>	<i>die</i>	<i>die</i>			<i>die</i>		

The process had the effect of bringing about AC insofar as in PDG a number of changes are observed insofar as the pronouns display a longer form with respect to the source morpheme preserved in the article. In particular, these changes characterize the genitive form respectively of the masculine/neuter singular *dessen*, of the feminine singular and of the common plural *deren/derer* (respectively used in pre- or postnominal position, cf. Gaeta 2017, 2018, for details), and of the common dative plural *denen* with respect to the corresponding forms of the article *des*, *der* and *den*. Although this process of differentiation is still ongoing, as is also testified by the variation observed for the forms *deren/derer*, it clearly contributes to AC, also in the sense that the oblique forms of the pronouns turn out to increase their formal coding. To achieve the differentiation, some morphological material is recruited for which two explanations have been suggested sharing the same rationale, namely analogical change. According to Lühr (1991), the inflectional ending of the 3rd person personal pronoun was recruited as shown by (7a), while for Bærentzen (2011) the inflectional ending of the adjective served for the differentiation (7b-c):

- (7) a. *Sie sehen die eltern und ireen / deren (< der) sun*
 ‘They see the parents and their (lit. of them / of these) son’
- b. *der schönen Frau* *deren Gesicht*
 ‘of the beautiful woman’ ‘her / whose face’
- der alten Häuser* *deren Dach*
 deren Gesicht ‘their / whose roof’
- c. *der Hauch frischer Luft* *der Hauch derer*
 ‘the breath of fresh air’ ‘the breath of this’
- inmitten grüner Felder* *inmitten derer*
 ‘amidst green fields’ ‘amidst these / which’

While Lühr’s explanation can only account for the different forms *derer*/*derer* via a quite complex chain of analogical changes, in Bærentzen’s account the difference straightforwardly results from the different inflectional markers of the adjectives found in pre- or postnominal position, respectively *-en* (7b) and *-er* (7c) (cf. Gaeta 2017, 2018 for a detailed discussion). Be that as it may, for our purposes the formal differentiation is the origin of the newly formed AC even though the latter was not sensibly aimed at by the change. In spite of its diachronic roll-out with the demonstrative serving as the source morpheme for the article, the innovation affects the less frequent morpheme which is relegated to a secondary role —and develops an extra-marking— by the now dominating article function, similarly to the developments observed for the present/future pairs in Tsakonian Greek and Udmurt in §2.1 above.

2.4. Borrowing as a source of AC

Finally, a further diachronic source of AC is borrowing. While the previous sources of AC can be said to pertain to the internal dynamics of a language system, borrowing calls into play an external —or extra-grammatically-initiated, cf. Wurzel (1994)— dynamics in which contact between two different systems is at stake. For our purposes, those cases of borrowing are relevant in which AC indirectly comes about. In this regard, the German loan suffix *-ieren* can be discussed. The suffix emerged already in MHG and occurred with loan verbs from Old French and Latin in texts of the 12th and 13th century (cf. Gaeta & Angster in press for discussion). Interestingly, *-ier(en)* emerges from the Old French infinitive suffix *-ier* in turn coming from Latin *-āre*, and testifies therefore of an inflectional affix which developed into a derivational loan verb marker. Accordingly, when Old French verbs like *logier* ‘to live’ and *turnier* ‘to tourney’, where *-ier* is an inflectional ending marking the infinitive form, were borrowed into

MHG, the French inflectional ending *-ier* was retained phonologically, but reanalyzed as a verbal marker requiring the addition of the MHG inflectional endings and in particular the infinitive suffix *-en*: MHG *losch-ier-en*, *turn-ier-en*. The suffix *-ieren* survives until present time becoming in fact extremely productive in PDG to form verbs usually with non-native bases: *Alarm* ‘alarm’ → *alarmieren* ‘to alarm’, *Dose* ‘can’ → *dosieren* ‘to dose’, etc., and marginally with native bases: *Gast* ‘guest’ → *gastieren* ‘to guest’, *Haus* ‘house’ → *hausieren* ‘to hawk’. It has to be stressed that the borrowing and the development of *-ieren* brought into the PDG word-formation system a new way for forming verbs besides the highly productive native conversions like *Würfel* ‘die’ → *würfeln* ‘to play dice’, *Zigeuner* ‘gypsy’ → *zigeunern* ‘to lead the life of a vagabond’, etc. In the native domain, verb-forming suffixes are nowadays unproductive and only sparsely attested in derivatives like *Kreuz* ‘cross’ → *kreuz-igen* ‘to crucify’, *Geist* ‘ghost’ → *geist-ern* ‘to haunt’ and few others (cf. Gaeta 2013 for a discussion). In other words, as a result of the borrowing of *-ieren* AC was partially introduced in the realm of verbal derivation, at least for the non-native lexical stratum.

3. Conclusion

Given the significant number and variety of possible sources through which language change turns out to give rise to AC, it is not surprising that the latter can be synchronically reanalyzed as iconic, unmarked, natural, etc. Accordingly, we can speculate that Humboldt’s Universal as well as the Meta-Iconic Markedness Principle result in fact from language change as a sort of side-effect. In a way, this reminds us of the unintended association between a certain behavior and a given epigenetic development suggested by Lieberman (2013: 257):

«Culture is the agent that shapes human ecosystems and hence intersects with biology at the genetic and epigenetic level. Epigenetics, the study of instances in which the DNA sequences that constitute the genetic code do not change but the expression of genes changes, also points to cultural-genetic interaction. Studies of mammalian species running the gamut from rodents to humans show that environmental factors can have epigenetic effects, changing the expression of genes. Rat mothers, for example, clean and groom their pups after birth, and some rats groom their pups to a much greater extent than other rat mothers. The mothers’ licking turns out to trigger the pup’s hippocampus, which, in turn, releases a sequence of hormones that change the expression of genes. Pups that are groomed to a greater extent are healthier, grow faster, and are «better» rats than those born to rat mothers who groom their pups to a lesser extent.»

Adopting the evolutionary metaphor, we can figure out a scenario in which AC —usually taken to motivate the synchronic principle of iconicity— results

in fact as an unintended side-effect from the different diachronic sources discussed above, to which other sources can probably be added (cf. in this regard Cristofaro 2014 for a similar point relating to the role of frequency). The epigenetic development, namely iconicity, can be seen as due to the interaction of different diachronic factors which follow their own «genetic» paths but happen to converge towards the same result. As already envisaged by Hermann Paul, this is another way of using the past to explain the present:

«How was the origin of language possible? This question can only be satisfactorily answered if we succeed in deducing the origin of language exclusively from the activity of those factors which we still see in activity in the further development of language.» (Paul 1891: 17-18)

In sum, we can tentatively think of Humboldt's Universal as well as of the Meta-Iconic Markedness Principle as different facets of an emergent principle resulting from the effect of several disparate factors independently modeling language change. Such an emergent principle of iconicity is epigenetic insofar as it results from the interaction of independent diachronic changes converging towards a dominant synchronic pattern which can be modeled in terms of uniformity of linguistic symbolization.

4. References

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